# *merlin* **v4: an updated platform for reconstructing genome-scale metabolic models**

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The Metabolic Models Reconstruction Using Genome-Scale Information (*merlin)* software (1) is an open source user-friendly *Java* (2) application developed for *Windows* and *Unix*, aimed towards the reconstruction of genome-scale metabolic models. The development of *merlin* follows a design philosophy of automating time-consuming steps in the reconstruction of genome-scale metabolic models, while allowing users to control the parameters of operations and manually curate the results. All major steps involved in the reconstruction of a metabolic model are implemented in *merlin*, including genome retrieval and its functional annotation, construction of the reactions' set and associated entities, model compartmentalization and conversion to standard *SBML* formats (3).

The fourth iteration of *merlin* includes a major overhaul of the user interface, implementation of new features, improvements to existing features, and most notably, the implementation of the object-relational mapping framework *Hibernate* (4). The graphical layout has been significantly streamlined, while supporting the latest version of *AiBench* (5), providing users with an intuitive and responsive interface. Development was also focused at new quality of life improvements, aimed mainly towards importing, exporting and duplicating *merlin* user projects. The development of the latest version of *merlin* followed a modular approach, culminating in the implementation of a plugin manager which simplifies and hastens the process of updating and debugging the various features of *merlin*.

In addition, *TranSyT*, a state-of-the-art genome-wide transmembrane transport system annotation tool has been implemented to overcome the limitations of the previously available *TRIAGE* module (6). Finally, it is noteworthy to mention the implementation of *BioISO*, a tool aimed at evaluating a genome-scale metabolic network or biomass formulation, based on the previously available *COBRA* (7) and *FBA* (8) frameworks.